CLAIM AMENDMENTS:

1. (original) A structure monitor system for analyzing a temperature, a distortion or a like physical quantity at a specified point of a structure, in which the physical quantity at one point on a boundary or inside of the structure is expressed by a governing equation, by a numerical analysis method by setting a specific boundary condition, and monitoring the structure based on the analysis result, comprising:

a measuring means for, using an optical fiber sensor laid on the boundary of the structure, measuring physical quantities of the structure at points on the boundary of the structure where the optical fiber sensor is laid,

a numerically analyzing means for calculating the physical quantity at the specified point of the structure by the numerical analysis method using the measured physical quantities by the measuring means as the boundary condition, and

a display means for displaying information on the analyzed physical quantity by the numerical analyzing means in relation to the position of the structure.

2. (original) A structure monitor system for analyzing a temperature, a distortion or a like physical quantity at a specified point of a structure, in which the physical quantity at one point on a boundary or inside of the structure is expressed by a governing equation, by a numerical analysis method by setting a specific boundary condition, and monitoring the structure based on the analysis result, comprising:

a measuring means for, using an optical fiber sensor laid at least either on the boundary of the structure or inside the structure, measuring the physical quantity of the structure at points on a part where the optical fiber sensor is laid,

a numerically analyzing means for deriving physical quantities at points on the boundary of the structure where the optical fiber sensor is not laid, which physical quantities are converted for the input as the boundary condition, from the governing equation using the measured physical quantities by the measuring means, and calculating an analyzed physical quantity at a specified point of the structure by the numerical analysis method using at least either the derived physical quantities or the measured physical quantities on the boundary as the boundary condition, and

a display means for displaying information on the analyzed physical quantity by the numerically analyzing means in relation to the position of the structure.

3. (currently amended) A structure monitor system according to claim ~~1 or~~ 2, further comprising a notifying means for giving a notification if the analyzed physical quantity by the numerically analyzing means exceeds a predetermined physical quantity.

4. (currently amended) A structure monitor system according to claim 2~~any one of claims 1 to 3~~, wherein the optical fiber sensor is laid on the outer surface of the structure.

5. (currently amended) A structure monitor system according to claim 2~~any one of claims 1 to 4~~, wherein the numerically analyzing means calculates the analyzed physical quantity using a boundary element method as the numerical analysis method.

6. (currently amended) A structure monitor system according to claim 2~~any one of claims 1 to 4~~, wherein the numerically analyzing means divides the structure into two areas partly overlapping each other; calculates physical quantities at

points in an overlapping area of the two areas by a boundary element method while calculating an analyzed physical quantity at a point in one area; and calculates an analyzed physical quantity at a point in the other area by a finite element method using the analyzed physical quantities in the overlapping area.

7. (currently amended) A structure monitor system according to claim 5, wherein:

the measuring means measures a distortion as the physical quantity a plurality of times at least for the substantially same point, and

the numerically analyzing means recognizes that a crack has been created in the structure when the measured distortion by the measuring means exceeds a specified permissible range; calculates an assumed distortion at a specified reference point of the structure by the boundary element method assuming the position and shape of the crack; and ~~identifies the position and shape of the crack~~ comparing ~~in such a manner as to minimize a difference between~~ the assumed distortion and a measured distortion at the reference point and executing calculation according to an optimization method to identify the position and shape of the crack ~~or an analyzed distortion at the reference point calculated by the boundary element method using the measured distortion as the boundary condition~~.

8. (currently amended) A structure monitor system according to claim 5, wherein:

the measuring means measures a temperature as the physical quantity a plurality of times at least for the substantially same point, and

the numerically analyzing means recognizes that an abnormally high temperature part has been produced in the structure when the measured temperature by the measuring means exceeds a specified permissible range; calculates an assumed temperature at a specified reference point of the structure by the boundary element method assuming the position and shape of the abnormally high temperature part; and comparing~~identifies the position and shape of the abnormally high temperature part in such a manner as to minimize a difference between~~ the assumed temperature and a measured temperature at the reference point and executing calculation according to an optimization method to identify the position and shape of the abnormally high temperature part~~or an analyzed temperature at the reference point calculated by the boundary element method using the measured temperature as the boundary condition~~.

9. (currently amended) A structure monitor system according to claim 2~~any one of claims 1 to 8~~, wherein the numerically analyzing means calculates the analyzed physical quantity by approximating the boundary condition on an infinite boundary to zero in the case of analyzing a specified point in the structure having the infinite boundary sufficiently distant from the specified point to be analyzed by the numerically analyzing means to make the boundary condition ignorable.

10. (currently amended) A structure monitor system according to claim 2~~any one of claims 1 to 9~~, wherein:

the measuring means includes a confirmation measuring means laid at an arbitrary position of the structure for measuring physical quantities at points of the laid position of the confirmation measuring means,

the numerically analyzing means calculates the analyzed physical quantities at the points where the physical quantity is measured by the confirmation measuring means, and

the display means displays information on the comparison of the measured physical quantity and the analyzed physical quantity at the same point.

11. (original) A structure monitor system according to claim 10, wherein the optical fiber sensor also serves as the confirmation measuring means.

12. (currently amended) A structure monitor system according to claim 2~~any one of claims 1 to 11~~, wherein the display means is provided separately from the numerically analyzing means and is connected with the numerically analyzing means via a communication means for transmitting and receiving information.

13. (currently amended) A structure monitor system according to claim ~~1 or~~ 2, wherein the optical fiber sensor is coated with a magnetically distortable member that is deformed according to a magnetic force.

14. (new) A structure monitor system according to claim 1, further comprising a notifying means for giving a notification if the analyzed physical quantity by the numerically analyzing means exceeds a predetermined physical quantity.

15. (new) A structure monitor system according to claim 1, wherein the optical fiber sensor is laid on the outer surface of the structure.

16. (new) A structure monitor system according to claim 1, wherein the numerically analyzing means calculates the analyzed physical quantity using a boundary element method as the numerical analysis method.

17. (new) A structure monitor system according to claim 16, wherein:

the measuring means measures a distortion as the physical quantity a plurality of times at least for the substantially same point, and

the numerically analyzing means recognizes that a crack has been created in the structure when the measured distortion by the measuring means exceeds a specified permissible range; calculates an assumed distortion at a specified reference point of the structure by the boundary element method assuming the position and shape of the crack; and comparing the assumed distortion and a measured distortion at the reference point and executing calculation according to an optimization method to identify the position and shape of the crack.

18. (new) A structure monitor system according to claim 16, wherein:

the measuring means measures a temperature as the physical quantity a plurality of times at least for the substantially same point, and

the numerically analyzing means recognizes that an abnormally high temperature part has been produced in the structure when the measured temperature by the measuring means exceeds a specified permissible range; calculates an assumed temperature at a specified reference point of the structure by the boundary element method assuming the position and shape of the abnormally high temperature part; and comparing the assumed temperature and a measured temperature at the reference point and executing calculation according to an optimization method to identify the position and shape of the abnormally high temperature.

19. (new) A structure monitor system according to claim 1, wherein the numerically analyzing means divides the structure into two areas partly overlapping each other; calculates physical quantities at points in an overlapping area of the two

areas by a boundary element method while calculating an analyzed physical quantity at a point in one area; and calculates an analyzed physical quantity at a point in the other area by a finite element method using the analyzed physical quantities in the overlapping area.

20. (new) A structure monitor system according to claim 1, wherein the numerically analyzing means calculates the analyzed physical quantity by approximating the boundary condition on an infinite boundary to zero in the case of analyzing a specified point in the structure having the infinite boundary sufficiently distant from the specified point to be analyzed by the numerically analyzing means to make the boundary condition ignorable.

21. (new) A structure monitor system according to claim 1, wherein:

the measuring means includes a confirmation measuring means laid at an arbitrary position of the structure for measuring physical quantities at points of the laid position of the confirmation measuring means,

the numerically analyzing means calculates the analyzed physical quantities at the points where the physical quantity is measured by the confirmation measuring means, and

the display means displays information on the comparison of the measured physical quantity and the analyzed physical quantity at the same point.

22. (new) A structure monitor system according to claim 21, wherein the optical fiber sensor also serves as the confirmation measuring means.

23. (new) A structure monitor system according to claim 1, wherein the display means is provided separately from the numerically analyzing means and is

connected with the numerically analyzing means via a communication means for transmitting and receiving information.

24. (new) A structure monitor system according to claim 1, wherein the optical fiber sensor is coated with a magnetically distortable member that is deformed according to a magnetic force.